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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/554,041	10/12/2000	Martin Lenfers	10191/1376	5483

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EXAMINER

OLSEN, KAJ K

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 03/10/2003

16

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/554,041

Applicant(s)

LENFERS ET AL.

Examiner

Kaj Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☒ Interview Summary (PTO-413) Paper No(s) 13.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 6-12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.
2. The claims stand rejected over 112, first paragraph as not being enabling with respect to the use of the terms “loaded voltage divider” and “negative feedback of a Nernst voltage circuits” (fuller discussion of the issues can be found in the previous final rejection (paper no. 10) and the advisory action (paper no. 12)). Applicant attempts to clarify these terms by providing figure 4 illustrating a conventional connectivity between a Nernst gas probe and an operational amplifier. The examiner is in agreement with the applicant that this figure does not constitute new matter. However, this figure and the applicant’s discussion concerning this figure do not appear to clear up the concerns the examiner has been addressing. In particular, on page 4 of the applicant’s remarks, applicant urges that “the Nernst voltage circuit is connected to the input of the operational amplifier”. The examiner fails to see this. Figure 4 shows the inner pumping electrode and the Nernst electrode being connected to *ground*, not to the operational amplifier. The operational amplifier is deriving its inputs from the reference electrode and a reference potential source. Figures 2, 3a, and 3b show how the applicant attaches a series of

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resistors to the Nernst electrode and the inner pumping electrode before the electrodes are connected to the sensor circuitry. Hence, if a person having reasonable skill in the art were to interpret fig. 2, 3a, and 3b in conjunction with fig. 4, one would appear connect point 34 (or 34' for fig. 3a) to ground. Is this the proper interpretation of fig. 4 in view of fig. 2, 3a, and 3b? For the purpose of the discussion to follow, the examiner will assume his interpretation is correct, but clarification is requested.

3. How does fig. 4 provide support and/or understanding for the claimed term “loaded voltage divider”? Nothing in the plurality of resistors of fig. 2, 3a, 3b appear to be “loaded” because the whole circuit is grounded and no potential is applied to the Nernst and inner pumping electrodes. Moreover, the term “voltage divider” implies some division of voltage across a larger voltage. The examiner cannot understand what this division of voltage would be and how it would be utilized in a sensor circuit when the conventional arrangement of electrodes includes grounding the inner pumping and Nernst electrodes.

4. Furthermore, how does fig. 4 and the discussion concerning it further elucidate an understanding of the claimed “negative feedback”? Applicant urges that as R_3 is increased, the negative feedback is increased. However, according to fig. 4 (and the examiner’s best interpretation of fig. 2, 3a, and 3b in view of fig. 4), this resistor would not in the operational amplifier circuit, rather it would be grounded. It is still unclear how this grounded resistor is contributing to the feedback of the amplifier when the resistor would appear to not be anywhere in the feedback circuitry. Clarification is requested.

5. Furthermore, the claims remained rejected over the use of the terms “optimized” or “maximized” feedback for the Nernst voltage circuit or pump voltage circuit (fuller discussion

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of the absence of enablement can be found in the previous office actions). In the response, applicant explains in greater detail how this circuit allows one to “optimize” negative feedback. However, this discussion only serves to further illustrate to the examiner his puzzlement over a clear meaning to any of these terms. In particular, applicant urges that the increased feedback causes the current supplied to the pump cell to be reduced to a “certain minimum pump current”. Thus the pump cell imposes an “upper limit” on the negative feedback (paragraph bridging pp. 4 and 5 of the response). What would constitute a “minimum pump current” or an “upper limit” on the feedback? How would one possessing ordinary skill in the know whether they have achieved a “minimum pump current” or an “upper limit” or an “optimized” feedback? There is no guidance in the originally filed disclosure, nor in the applicant’s arguments, for assisting one possessing ordinary skill in the art in understanding any clear metes or bounds of these terms. Moreover, the examiner’s understanding of pump cells is they deliver a level of current that is a function of the amount of oxygen gas in the exhaust atmosphere. When the oxygen level is low, very little pump current is necessary to maintain the desired potential difference between the Nernst electrode and the reference electrode. When the oxygen content is high, more pump current is necessary to maintain said potential difference. In other words, the pump current measured is proportional to oxygen concentration. However, applicant’s discussion of the pump current only addresses the pump current as being something that must be minimized to some level based on the negative feedback. How would one possessing ordinary skill in the art be enabled for choosing these resistors to arrive at a pump current above a minimum pump current when the current itself is also a function of the amount of oxygen in the analyzed gas?

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6. Claims 6-12 also are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

7. In claim 6, applicant has added that the negative feedback is optimized such that the pump cell is not “adversely affected”. There does not appear to be any support for this term in the originally filed disclosure. Rather this term originates from the applicant’s after final arguments. Because there is no original support for this term in the specification, this term also lacks enablement because it is entirely unclear based on the specification what would reasonably be interpreted as an adverse affect on the operation of the pump cell.

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 6-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. In claims 6 and 7, it is still unclear what constitutes an “optimized” or “maximized” feedback. Applicant’s further discussion of the invention has not sufficiently elucidated what the metes and bounds of these terms are. Applicant urged that “optimized” and “maximized” referred to setting the negative feedback to an “upper limit” such that a current is above a “minimum pump current”. However, as discussed above, the examiner cannot discern any clear meaning of any of these terms from the original filed disclosure nor from the applicant’s arguments. On page 6, applicant urges that there is a definitive point at which the pump current

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becomes too low for effective operation of the pump cell. That may be, but the applicant has never defined (either specifically or generally) what constitutes an “effective operation”, nor have they defined (either specifically or generally) what a “minimum pump current” would be. Hence the metes and bound of the terms “optimized” and “maximized” remain unclear.

11. In addition, it is unclear how to interpret the “maximized” of claim 7 as it depends from claim 6 which utilized “optimized”. In applicant’s own discussion, they urged that increasing the negative feedback reduced the ripple about $\lambda=1$, but the continued increase in negative feedback eventually caused the pump current to reduce below a minimum pump current. To avoid that, applicant imposed an upper limit on the feedback (paragraph bridging pp. 4 and 5 of applicant’s most recent response). However, claim 7 merely instructs maximizing the feedback even though applicant has argued in their response that one shouldn’t maximize the feedback because it causes the pump current to fall below a certain minimum level. Hence, it is entirely unclear how to interpret claim 7’s requirement for a “maximized” feedback when their discussion teaches against doing so. Moreover, how is claim 7’s “maximized” meant to be interpreted when claim 6 recites that the feedback should be “optimized” instead. The term “optimized” clearly has different scope and meaning than “maximized”, and “maximized” would not appear to fall within the metes and bounds of “optimized”.

12. Claim 6 is also indefinite because it is unclear what would reasonably be construed as being an “operation of the pump cell” and would constitute an adverse affect on that operation.

13. The examiner will withdraw the outstanding 112 second paragraph rejections of claims 10-12 because the terms “minimized” cross-section and “maximum” length would appear to be bounded by the requirement that these minimized cross-sections and maximized length have to

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assist in providing the “optimized” feedback of claim 6 (from which they depend). Hence, assuming one possessing ordinary skill in the art were clear what the optimized feedback was referring to, then the metes and bound of the terms “minimized” and “maximum” would be also understood.

Response to Arguments

14. Applicant traverses a number of the examiner’s 112 rejections. The examiner’s response to these arguments were addressed in the actual rejections above and will not be reiterated here.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (703) 305-0506. The examiner can normally be reached on Monday through Thursday from 7:00 AM-4:30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner are unsuccessful, the examiner’s supervisor, Mr. Nam Nguyen, can be reached at (703) 308-3322.

When filing a fax in Group 1700, please indicate in the header “Official” for papers that are to be entered into the file, and “Unofficial” for draft documents and other communications with the PTO that are not for entry into the file of this application. This will expedite processing of your papers. The fax number for regular communications is (703) 305-3599 and the fax number form after-final communications is (703) 305-5408.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0661.

A handwritten signature in black ink, appearing to read 'Kaj Olsen', with a stylized flourish extending to the right.

Kaj K. Olsen
Patent Examiner
AU 1753
March 7, 2003